Aquatic Life Monitoring Update
Bill Harrison
TCEQ Surface Water Quality Monitoring Team

1. Tracking planned Aquatic Life Monitoring Events as proposed on the CRP Coordinated Monitoring Schedule

2. Analysis of the spatial distribution of existing biological samples

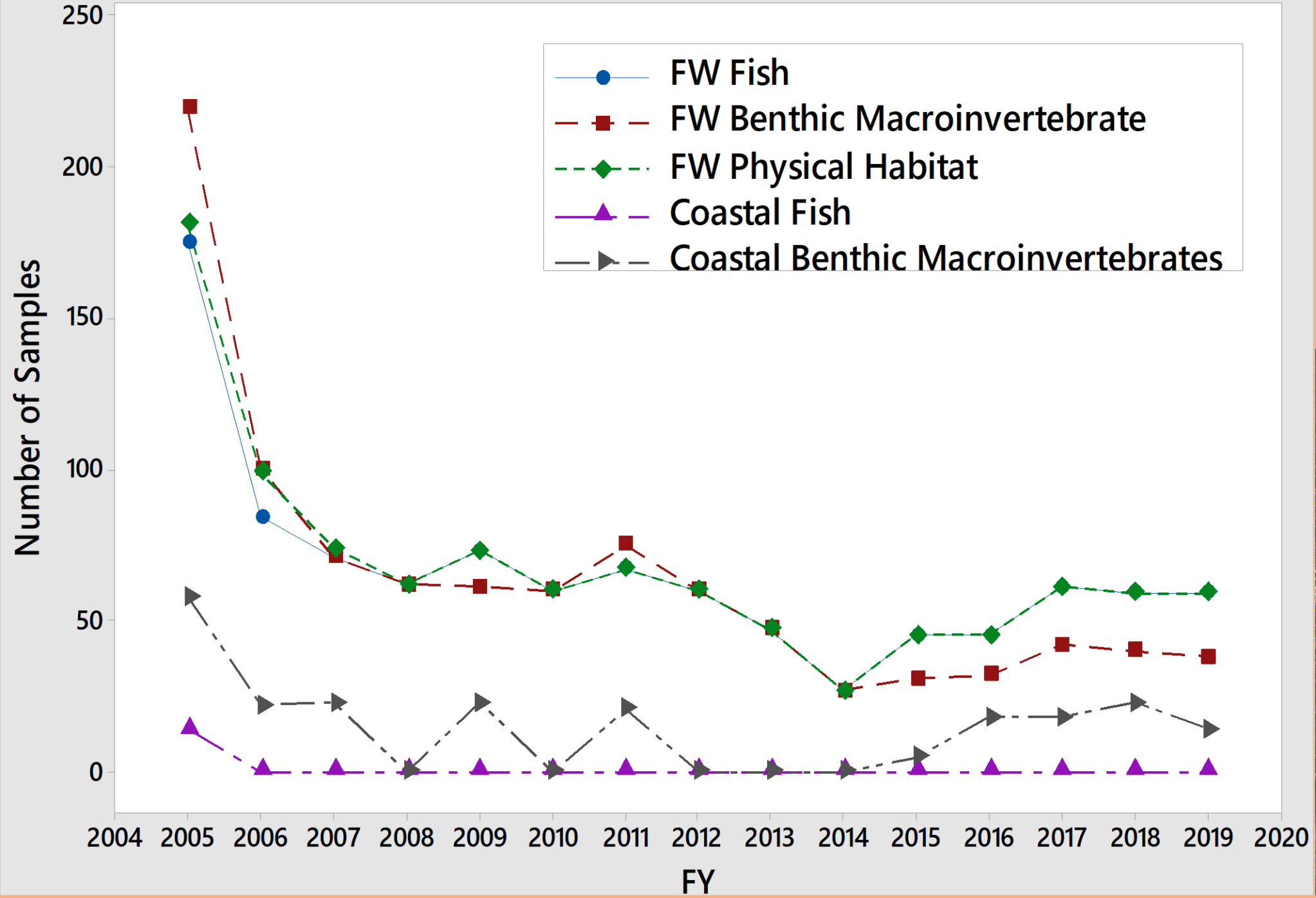
3. Least Disturbed Streams Project

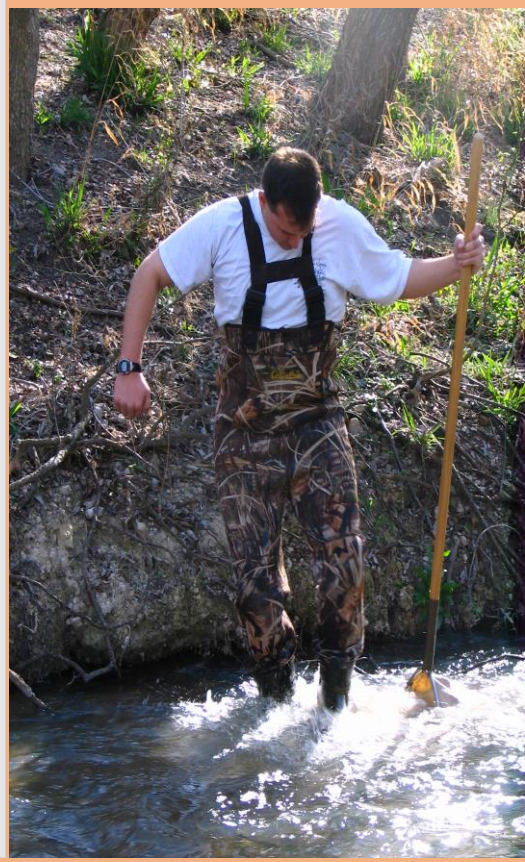
4. Tidal Streams IBI Project

5. Evaluating the integrity of coastal stream habitats and their use by marine migrants. Dr. Christopher Patrick, TAMUCC

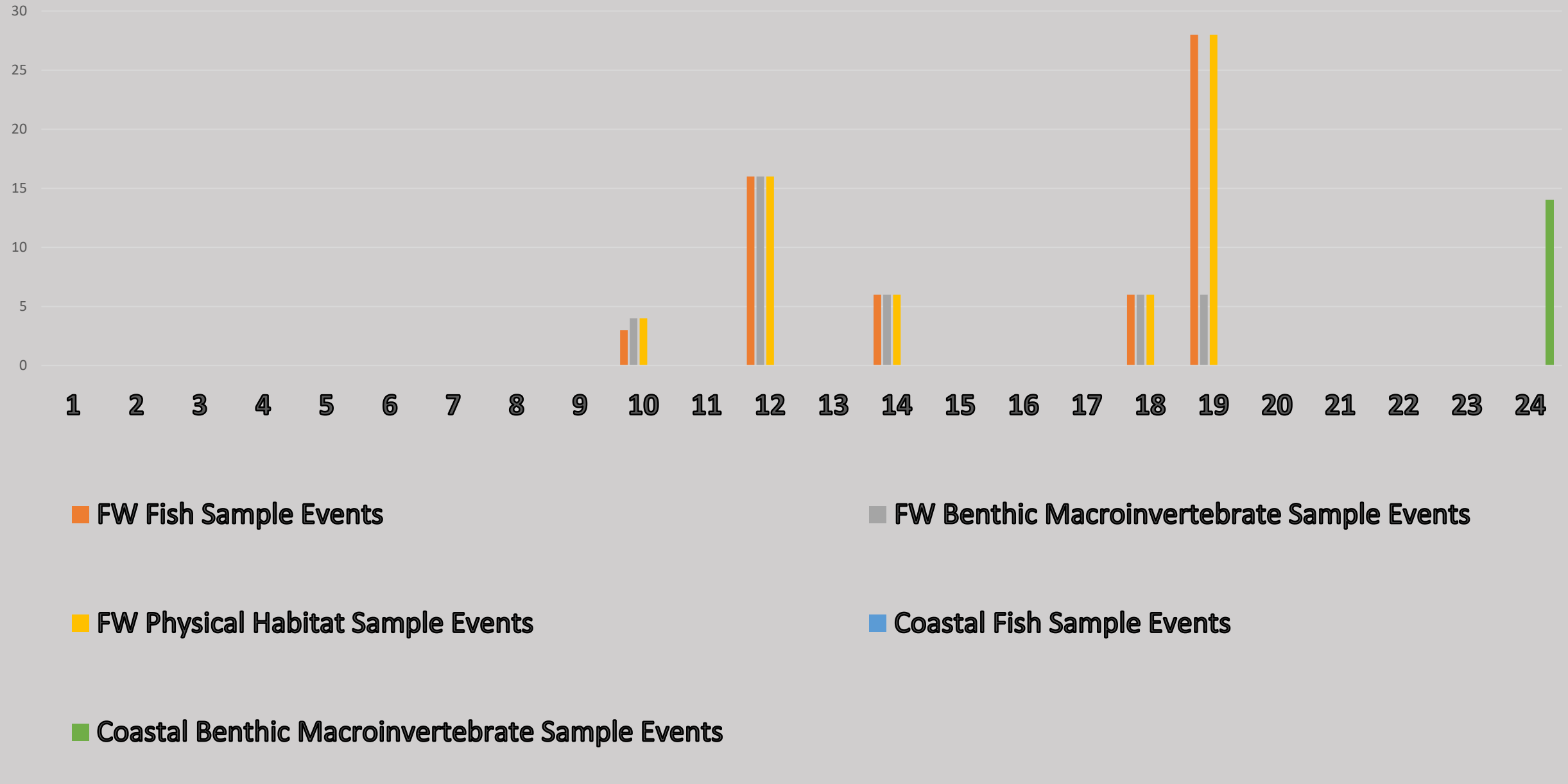
6. Seagrass Monitoring

Projected Aquatic Life Monitoring Events by Year and Sample Type



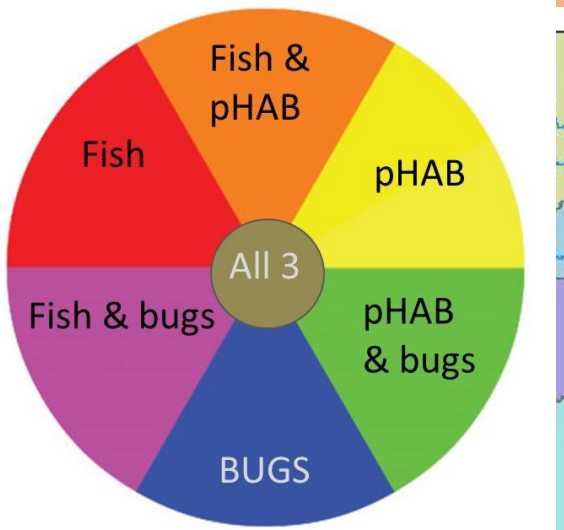


2019 CMS Projected Bioassessment Sample Events by Basin



TCEQ/TPWD Interagency Bioassessment Workgroup

- Analysis of the spatial distribution of existing biological samples
  - Coordinated effort between TCEQ and TPWD to develop a consolidated data base of Aquatic Life Monitoring (ALM) data collected by each agency;
  - Develop GIS based maps to depict the spatial distribution of aquatic life monitoring sample events;



TCEQ and TPWD Interagency Bioassessment Workgroup Activities: Analysis of the Spatial Distribution of Existing Aquatic Life Monitoring Samples

Biological samples by basin

- Scope
  - TCEQ SWQM/CRP & TPWD ALM
  - Sample Site Locational Data
  - Types of data collected
- Uses
  - Reference Tool
    - Easy search tool for locating historical Data
  - Planning Tool
    - Provides visual of existing ALM data to assist with planning future ALM

TCEQ/TPWD Interagency Bioassessment Workgroup: Texas Aquatic Ecoregion Project, Least Disturbed Streams

- Least Disturbed Stream: No or little urban development, no significant point source discharges, no channelization, no atypical NPS, perennial flow or perennial pools
- Presumed to define good ecological condition
- Aquatic Life Monitoring (ALM) conducted in LDS's in each ecoregion;
- Metrics and indices
  - Determining support of designated aquatic life use categories for the Integrated Report;
  - Use attainability analyses to determine appropriate aquatic life use for water bodies

TCEQ/TPWD Interagency Bioassessment Workgroup: Texas Aquatic Ecoregion Project, Least Disturbed Streams

- Primary subject areas the LDS Report will inform:
  - Characterize each candidate LDS watershed and provide land use thresholds
  - Characterize each candidate LDS water quality and provide water quality thresholds
  - Define expectations for LDS fish & macroinvertebrate assemblages in each ecoregion and provide data for refinement of existing regionalized IBI's
  - Comparative historical perspective on fish and macroinvertebrates at sample sites with long term data sets.
- Draft Report April 2019
- Contact: Bill Harrison Bill.Harrison@tceq.Texas.gov

LDS Project provides data for:

- Seven “aggregated Ecoregions”;
  - Regionalized Fish IBI (Texas Parks and Wildlife Dept. 2002)
  - Draft Regionalized Benthic Macroinvertebrate IBI

Aggregated Level 3 Ecoregions:

- Chihuahuan Deserts (24);
- High Plains/Southwestern Tablelands (25/26);
- Central Great Plains/Cross Timbers/TX Blackland Prairies (27/29/32);
- Edwards Plateau (30);
- Southern TX Plains (31);
- Western Gulf Coastal Plains (34);
- E. Central TX Plains/S. Central Plains (33/35);

ER	Seg	Station	Stream	Coordinator	Notes
24	2310	13429?	Upper Pecos @ Sheffield	BH	conductivity-biological study
24	2310	18801	Lower Pecos	BH	conductivity-biological study
24	2310A	13109	Independence or Live Oak	BH	conductivity-biological study
30	1430	?	Barton Creek	BH	LDS
30	1430B	new	Little Barton Creek	BH	LDS
26	Basin 2	new	Elm Creek @ SH83	LP	LDS
27	0222A	10076?	Lelia Lake Creek	LP	LDS
26/27	224	10178?	N Fork Red	LP	LDS
26	Basin 2	new	Little Red River	LP	LDS
34	Basin 20	new	Blanco Creek	LR	LDS
34	Basin 22	new	Los Olmos Creek	LR	LDS
34	1302B_01	20721	West Bernard Creek	SW	LDS
34	1305_03	12155	Caney Creek (above tidal)	SW	24hr DO Project only
34	1202J	16353	Big Creek	LR	LDS
30	1427A_01	12185?	Slaughter Creek	SW	ALM
31	Basin 23	new	Las Moras Creek	SW/LP	LDS
31	2109	12985?	Leona River	SW/LP	LDS
31	2313	15820?	San Felipe?	SW/LP	LDS

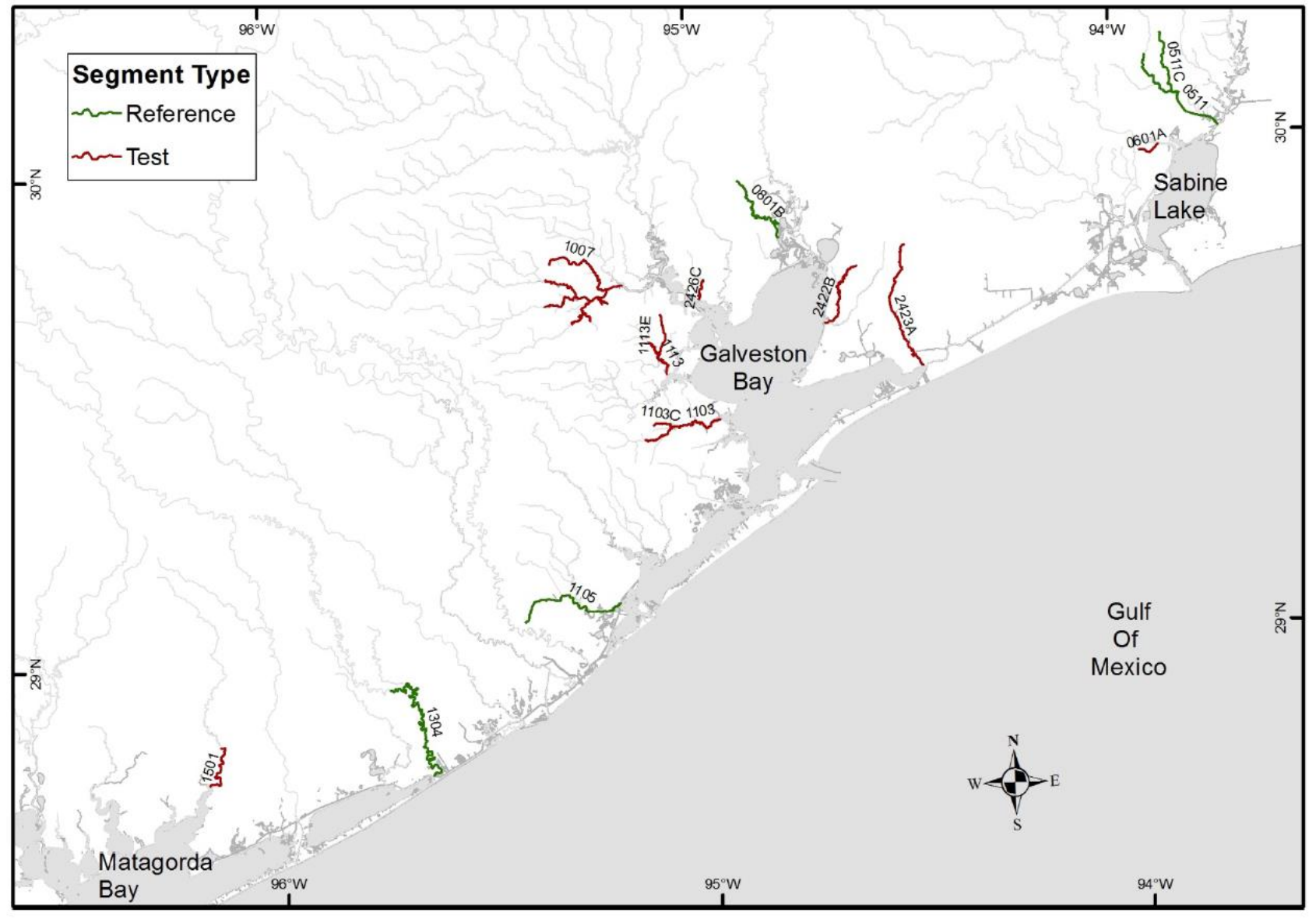
Proposed Candidate Field Sample Events for FY 19 if interested contact: Sarah.Whitley@tceq.Texas.gov

TCEQ/TPWD Interagency Bioassessment Workgroup: Tidal Streams IBI for Texas Coastal Streams

Freshwater IBI is not designed to assess biological communities of tidal streams. A TIBI (tidal streams IBI) will be used to evaluate standards for dissolved oxygen and aquatic life use in tidal streams.

- **Project goal**:
  - Collect water quality and biological data from tidal streams along the entire Texas coast following methods established by Linda Broach. Select distinguishing community metrics to use as scoring criteria in a TIBI – regional IBI's may be appropriate.
- **Contractor**: Dr. Jennifer Pollack of Texas A&M University Corpus Christi
- **Timeline**
  - FY 18/19 – sample 15 water bodies on the upper coast (5 reference, 10 test)
  - FY 20/21 – develop IBI metrics with data from upper coast and sample 15 water bodies on lower coast
  - FY 22/23 – develop IBI metrics with lower coast data

Water bodies included in the Tidal Index of Biotic Integrity (FY 18/19)



Water bodies included in the Tidal Index of Biotic Integrity (FY 18/19)

Table B1.1 Sampling Sites and Monitoring Frequencies (first two-year period)

Segment	Region	Water body	24 HR	Aquatic Habitat	Benthics	Nekton	Conventional	Field
Reference Sites								
511	10	Cow Bayou Tidal	4	4	2	4	4	4
0511C	10	Cole Creek	4	4	2	4	4	4
0801B	12	Old River	4	4	2	4	4	4
1105	12	Bastrop Bayou Tidal	4	4	2	4	4	4
1304	12	Caney Creek Tidal	4	4	2	4	4	4
Test Sites								
0601A	10	Star Lake Canal	4	4	2	4	4	4
1007	12	Houston Ship Channel/Buffalo Bayou	4	4	2	4	4	4
1103	12	Dickinson Bayou Tidal	4	4	2	4	4	4
1103C	12	Geisler Bayou	4	4	2	4	4	4
1113	12	Armand Bayou Tidal	4	4	2	4	4	4
1113E	12	Big Island Slough	4	4	2	4	4	4
1501	12	Tres Palacios Creek Tidal	4	4	2	4	4	4
2422B	12	Double Bayou West Fork	4	4	2	4	4	4
2423A	12	Oyster Bayou	4	4	2	4	4	4
2426C	12	Goose Creek Tidal	4	4	2	4	4	4

Evaluating the integrity of coastal stream habitats and their use by marine migrants. Dr. Christopher Patrick, TAMUCC

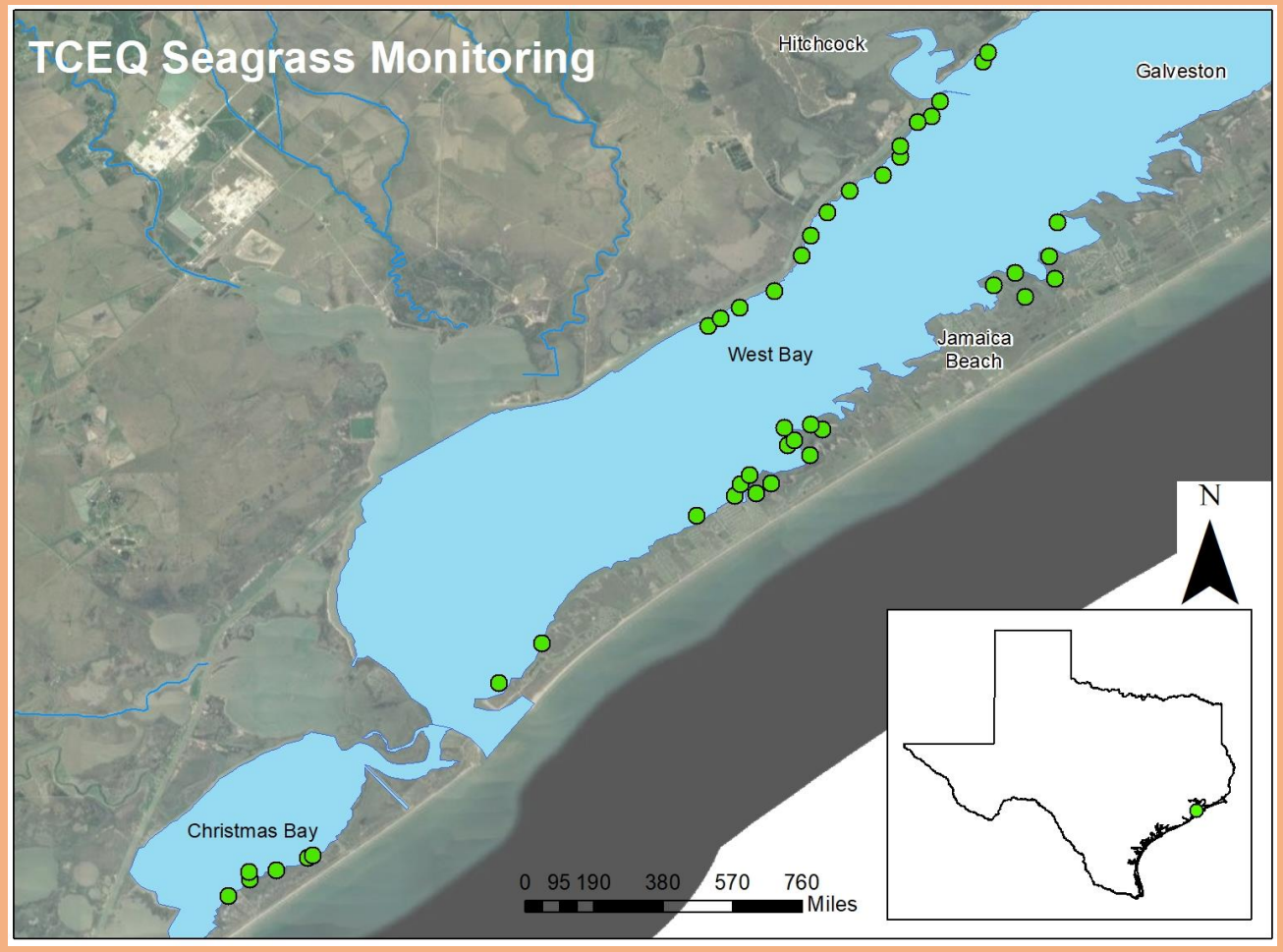
- Streams in the Gulf Prairies and Marshes (ecoregion 34) in four watersheds: Baffin Bay, Mission-Aransas Bay, San Antonio Bay, and Matagorda Bay;
- In each watershed, six study sites selected (24 total):
  - four non-tidal sites
  - two tidal sites
- At each site:
  - (1) survey fish and macroinvertebrate communities,
  - (2) water samples
  - (3) Diel field measurements
  - (4) algal growth rates and benthic algae characterization
  - (5) Physical Habitat.

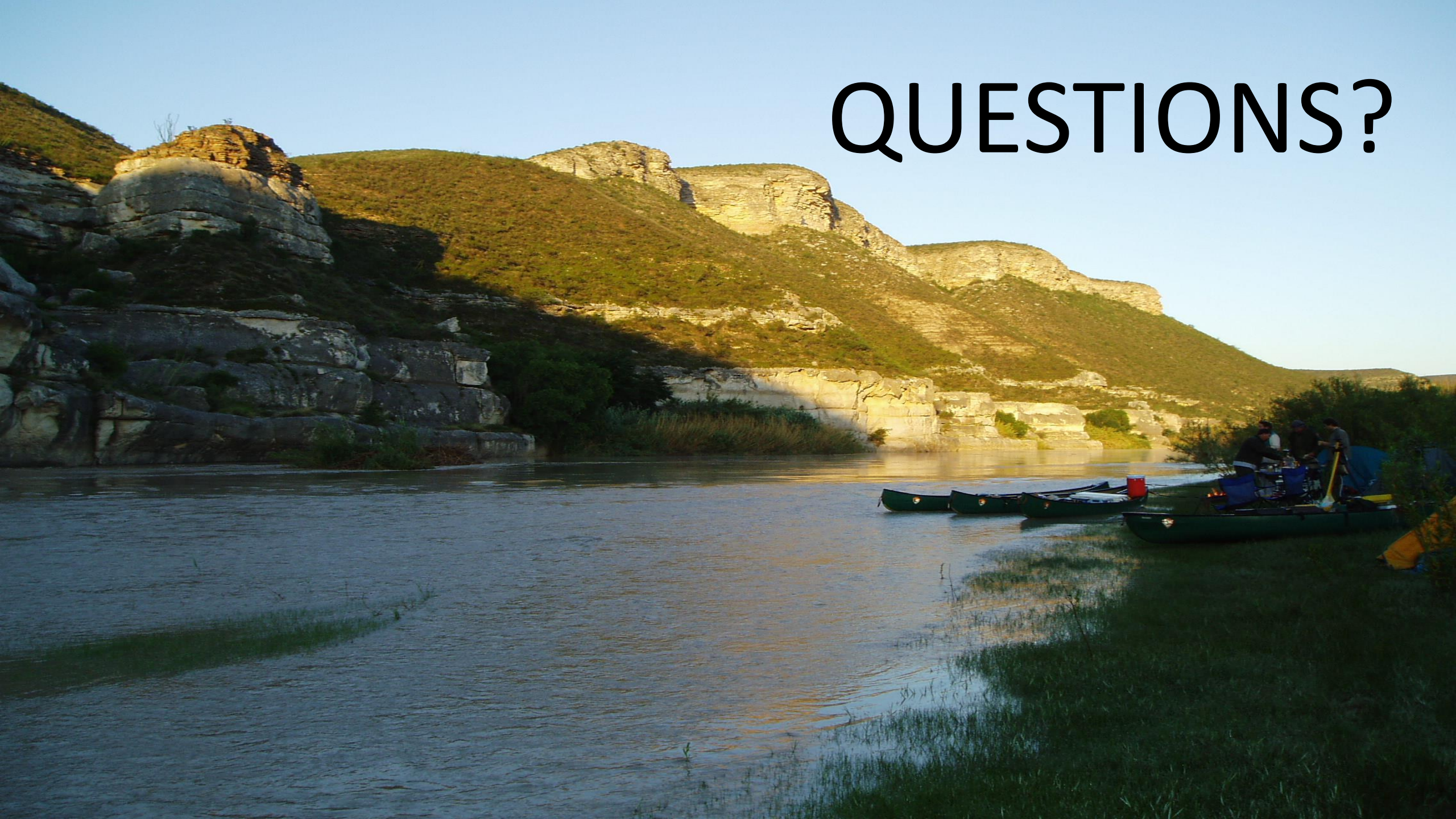
- Data useful for development/refinement of IBI's for non-tidal and tidal streams along the Texas coast
- Sampling Index 2020; Project Summary and Presentation to TCEQ/TPWD March 2021
- TCEQ (Bill Harrison) and TPWD (Stephen Curtis): Project planning, quarterly meetings

Bill.Harrison@tceq.Texas.gov Stephen.Curtis@tpwd.Texas.gov

Seagrass Monitoring in Galveston Bay System

- Annual monitoring takes place during seagrass peak biomass (Aug-Sep)
- West Bay: 36 stations
  Christmas Bay: 6 stations
- Recent sampling occurred September 10-12, 2018
  - Encountered bad weather
  - Collected all samples in Christmas Bay and 28 samples in West Bay
- Huge shout-out to R12-Houston for their field assistance and running samples to the SL LAB!




QUESTIONS?

Mussel Monitoring Update

- Draft protocol complete and pilot study QAP approved
- Objective of protocol is to determine if mussels are present and to collect a representative sample of the species present
  - Qualitative timed search
  - minimum 5 person hours
- Pilot study to test protocol is complete
  - Summary report and final chapter for Volume 2 in progress

Waterbody	Site Location	Station ID	River Basin	Date	total survey time (person-hours)	total survey area (m^2)	reach length (m)	dominant substrate type	collection method(s)	live mussels collected	dead mussels collected	live species
Spring Creek	Decker Prairie Rd	11323	San Jacinto	6/8/2017	7.5	1080	235	sand	tactile, visual	Y	Y	Sandshell, W. Pimpleback, LA Fatmucket
James Bayou	SH 43	14976	Cypress Creek	7/6/2017	6	415	310	silt	tactile	Y	Y	Pondhorn
Neils Creek	CR 4125	21999	Brazos	7/18/2017	5	58			tactile,			
Piney Creek	FM 2262	10530	Neches	7/26/2017	5	23						Pondhorn, LA Fatmucket, Round Pearlshell
Nueces River	FM 1042	12972	Nueces	8/23/2017	7.3	41						Sandshell, S. Mapleleaf, Golden Orb, Threeridge
Nueces River	SH 16	12973	Nueces	8/24/2017	6.6	74						Sandshell, Golden Orb, TX Lilliput
N. Fork Guadalupe River	Camp Waldemar	12682	Guadalupe	5/2/2018	6.1	295	222	cobble/ gravel	Tactile	Y	N	TX Fatmucket, TX Lilliput
San Pedro Creek	Mission Tejas SP	22071	Neches	5/30/2018	5	375	236	Sand	Tactile	Y	N	Pondhorn, TX Lilliput